Vaginal Birth After Cesarean Section in Hawaii Experience at Kapiolani Medical Center for Women and Children

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Medical records at Kapiolani Medical Center for Women and Children were reviewed for cases that had a trial of labor subsequent to prior cesarean section during the period January 1990 to July 1991. All cases were ≥ delivered 36 weeks' gestation. During the 19-month period, 356/483 or 73.5% cases with a trial of labor had successful vaginal births after previous cesarean sections (VBAC). The majority of the others that did not were due to failure of progression in labor. The incidence of scar separation was 5/483 (1.04%). There were 5/483 neonates with Apgar scores of ≤ 6 at 5 minutes, giving a perinatal morbidity rate of 1.04%. There were no maternal deaths. Oxytocin induction resulted in successful VBAC in 30/47 (63.8%) cases. This study concludes that a trial of labor for vaginal birth after cesarean section is well established at our institution. In addition, the rates of successful VBAC, its complications and outcomes, are comparable to national averages.

Introduction

The dictum "once a cesarean, always a cesarean" was stated by Dr. Edwin Craig in 1916[1]. This was applied in an attempt to avert catastrophic maternal and fetal loss associated with uterine rupture during labor[2]. In the United States, no maternal death from a ruptured lower-segment cesarean scar has been reported for more than 20 years3·[1]. Almost 1-million cesarean sections (C-sections) are performed in the United States annually and the single most-common indication for major surgery has been elective, repeat, cesarean sections[4]. In terms of the ever-rising cost of medicine, it is estimated that a 1% reduction in the C-section rate would save nearly $27 million a year[5]. In 1982, the American College of Obstetricians and Gynecologists (ACOG) published its first guidelines for vaginal birth after C-section (VBAC)7. The ACOG paper summarizes the data of VBAC statistics using ACOG guidelines at Kapiolani Medical Center for Women and Children (KMCWC) from January 1990 to July 1991.

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Patients and methods

Data on labor, delivery and maternal and neonatal outcomes were obtained from the "final diagnosis" records of women ≥ 36 weeks' gestation with a history of previous C-section who were delivered vaginally in January 1990 to July 1991. Thirty-six weeks' gestation was chosen as the cut-off to eliminate prematurity as a complicating factor. Data recorded included: Success or failure of the VBAC attempt, indication for repeat cesarean, method of vaginal delivery (spontaneous or operative), incidence of perineal lacerations, incidence of uterine scar separation, Apgar scores, twin deliveries, breech deliveries, shoulder dystocias, and the use of Oxytocin for induction of labor. Deliveries were performed by attending physicians or by supervised residents of all levels.

During the period January 1990 to July 1991, there were 748 patients with a history of previous C-section (Table 1). Of the patients who underwent a trial of labor, 346/483 were delivered vaginally, giving a successful VBAC rate of 73.7%; the other 127/483 (26.3%) patients required a repeat C-section. Indications for repeat cesarean in the failed trial-of-labor group included: Failure to progress, fetal distress, cord prolapse and preeclampsia (Table 2).

Of the 356 successful VBAC patients, 274 (77%) gave birth spontaneously; 82 (23%) required an operative delivery *per vaginum* with vacuum or forceps. All patients who developed a third or fourth degree laceration, vaginal vault laceration, or cervical laceration which required repair were included in this study. The incidence of perineal laceration in the women delivering spontaneously was 17/274 (6.2%), and in the case of operative deliveries was 12/82 (14.6%). The overall incidence of significant perineal lacerations in the VBAC patients was 29/356 (8.1%).

There were 5 cases of uterine scar separation in the 483 women who underwent a trial of labor after previous C-section resulting in an incidence of 1.04%. During this same time period, 265 women underwent routine repeat cesarean section with one case of scar separation resulting in an incidence of 0.38%.

There were 5 infants out of the 483 cases of VBAC with an Apgar score of <6 at 5 minutes, resulting in a perinatal morbidity rate of 1.04%. One case was due to fetal distress, and

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the other 4 were due to intrauterine fetal demise resulting from 2 cases of *abruptio placentae*, one cord accident and one trisomy.

There were 3 sets of twins in the VBAC group in this study (Table 3). All 3 were vertex/vertex presentations and were delivered vaginally with excellent maternal and neonatal outcomes.

Three patients were delivered by breech extraction in the VBAC group (Table 4); birth-weights ranged from 1905 to 3274 grams. Two had vaginal deliveries with excellent outcomes; the third was stillborn secondary to trisomy 18. There were no maternal complications in the 3 cases.

There were 2 cases of VBAC with shoulder dystocia (Table 5). One infant had a birth-weight of 3980 grams and there were no complications. The other case had an infant weighing 3805 grams which resulted in a uterine dehiscence that did not require repair. Both infants had good neonatal outcomes.

Forty-seven patients with prior cesareans required induction of labor with Oxytocin; of these, 30 (63.8%) had successful VBAC.

Discussion

Since the American College of Obstetricians and Gynecologists published its first set of guidelines in 1982 for vaginal birth after C-section (VBAC), the incidence of trial of labor in patients with a scarred uterus has increased dramatically[8]. The trial-of-labor rate of 65% reported here is at the higher end of the range of 36% to 66% reported in other VBAC studies[4,8,9].

A survey by Shiono et al in 1987[10] showed that 92% of women with a history of previous C-section were delivered by elective, repeat cesarean. In addition, 54% of the nation's hospitals had never attempted VBAC at that time[4].

As a teaching hospital, KMCWC has 24-hour, in-house physician coverage and encourages VBAC candidates to attempt a trial of labor if no absolute contraindications exist. The successful VBAC rate at our institution of 73.7% is comparable to the national range of 54% to 89%[2]. The majority of unsuccessful cases (76%) was secondary to failure of progression in labor. This is consistent with other VBAC studies which also find this to be the most common cause of failed VBAC[2,8].

Our study looked at potential complications of vaginal birth after cesarean. One of the potential complications is significant perineal laceration. A study by Yetman and Nolan in 1989 showed that the incidence of significant perineal lacerations, including a "third-degree" tear (complete disruption of the rectal sphincter with intact rectal mucosa), "fourth-degree" tear (disruption of the rectal mucosa and the sphincter muscle) were significantly higher in VBAC deliveries[9]. Yetman and Nolan observed a 31% laceration rate in normal VBAC deliveries and a 56% laceration rate in operative VBAC deliveries. Our study reports a 6.2% and 14.6% laceration rate for normal and operative VBACs respectively. This is considerably less than Yetman's study. In addition, our rates of perineal lacerations also are less than those of Yetman's control population of patients without prior cesarean (19% for NSDs and 49% for operative vaginal deliveries).

Another complication of VBAC is uterine scar separation. Most large-scale studies of VBAC have found the incidence of

Table 1. Vaginal birth after Cesarean section (VBAC) January 1990 to July 1991 (19 months)

Total previous C-section (C/S) patients	748
Patients electing trial of labor	483 (64.6%)
Successful vaginal delivery in trial of labor patients	356 (73.7%)

Table 2. Indications for repeat C-section in patients who elected a trial of labor after previous C/S

Indication	patients	%
Failure to progress	96	76
Fetal distress	26	20.5
Cord prolapse	3	2
Pre-eclampsia	2	1.5
Total	122	100

Table 3. VBAC-Twin Deliveries January 1990 to July 1991

Presentation	Weight in g	Apgar @ 5 min	Prior C/S Indication
Vtx/Vtx	3095/2560	9/9	Failure to progress
Vtx/Vtx	2735/2700	9/7	Breech
Vtx/Vtx	3095/3065	8/9	Fetal distress

Table 4. VBAC - Breech Deliveries January 1990 to July 1991

Weight in g	Apgar @ 5 min	Prior vaginal delivery
3274	8/9	Yes
2240	8/9	Yes
1905	0/0	No

Table 5. VBAC - Shoulder Dystocia January 1990 to July 1991

Prior C/S Indication	Weight in g	Apgar @ 5 min	Complication
Face presentation	3805	7/9	Uterine dehiscence
Failure to progress	3980	3/8	None

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scar separation to be between 0.50% and 2.23%[9]. The outcomes of scar separation range from asymptomatic, found on manual exploration, to catastrophic with fetal distress and hemorrhage requiring hysterectomy. As surveyed by Flamm et al, there have been no American reports of a perinatal or maternal loss attributable to complete rupture or dehiscence of a lower uterine segment scar[4]. Our data, January 1990 to July 1991, show a scar-separation rate in patients with a trial of labor after previous cesarean delivery of 1.04%. However, routine manual exploration of the lower uterine scar was not mandatory in this study and asymptomatic separations may have gone undetected. This is compared to the scar-separation rate of 0.38% in patients who elected to have a repeat cesarean section. Prior studies have not found statistical significance between groups undergoing a trial of labor and those having repeat C-sections[2]. The latest report of maternal mortality published by the State Department of Health in 1989 shows that cesarean delivery still carries a 3-fold risk of mortality compared to vaginal delivery.

Another potential complication of VBAC is fetal morbidity and mortality. No delivery route is free of risk to the fetus. However, it has been shown that when iatrogenic prematurity is eliminated, respiratory morbidity, regardless of gestational age, is higher in pregnancies that are delivered abdominally than in the absence of labor[3]. Examination of Apgar scores after a VBAC attempt reveals that 5 infants out of 483 (1.04%) VBAC births had an Apgar score of ≤6 at 5 minutes. This is comparable to other VBAC study rates that range from 1.79% to 3.90%9. The perinatal mortality rate in this study population was 8.3/1000. This is comparably less than the rate of 18/1000 reported for a trial of labor in a meta-analysis review of 10 studies that included over 4500 births[1]. In addition, our rate was less than their reported perinatal mortality rate of 10/1000 births for elective repeat C-section.

Twins, which occur in approximately 1% of all pregnancies, represent a small but significant group of patients who might be considered candidates for a trial of labor after prior cesarean delivery. In a 1989 study by Strong and Phelan, 72% of patients with twin gestation who underwent a trial of labor were delivered vaginally of both infants. The study showed that unlike singleton pregnancies, successful vaginal delivery rates for twins appear to be unrelated to the reason for primary C-section1,2. In addition, there were no significant differences in maternal or neonatal morbidity or mortality rates in any comparison of trial of labor versus no trial of labor including Apgar scores, birth trauma, neonatal death, birth weight, uterine dehiscence or hysterectomy rates. At our institution, 3 patients with twins underwent a trial of labor and were all delivered vaginally and successfully. All 3 sets were vertex/vertex presentation and had excellent maternal and neonatal outcomes.

Aproximately 100,000 cesareans are performed yearly for breech presentation to avoid the complications associated with a vaginal breech delivery, including arrest of the aftercoming head and brachial plexus injury. Therefore, there is very little data regarding outcomes of the breech VBAC infant. However, Sarno and Phelan performed a prospective study on 27 patients with breech presentation and a prior C-section. Their study showed that 50% of patients with a trial of labor for breech with a prior C-section can be expected to be delivered without an increase in fetal or maternal morbidity or mortality. At KMCWC, 3 patients with a breech presentation underwent a trial of labor. All 3 were delivered vaginally. One case was an intrauterine fetal demise secondary to trisomy 18; labor was induced. The other 2 cases had good neonatal outcomes; there were no maternal complications. It is obvious that more study is needed in this area.

ACOG guidelines currently hold that Oxytocin administration during an attempted VBAC remains controversial. However, several studies have shown that the use of Oxytocin for induction or augmentation of labor in gravidas with prior lower segment deliveries have approximately a 63% chance of successful VBAC[1].

In addition, studies show no increased risk of uterine dehiscence or rupture, need for transfusion, birth trauma, or adverse maternal or neonatal outcome. At our institution, 63.8% of patients whose labor was induced had successful VBAC, compared to 73.7% who were delivered vaginally without Oxytocin. Our rates are comparable to those in other large-scale studies.

Summary

This study confirms that trial of labor for vaginal birth after C-section is well established at Kapiolani Medical Center for Women and Children in Honolulu, Hawaii, for routine pregnancies, with an excellent chance of success and with low rates of complication in both mother and infant. In addition, as research and technology broadens, trial of labor may become more common; in the less ordinary obstetrical cases, the presence of a perinatologist is helpful.

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